

## Taxonomic notes on the *Angianthus drummondii* complex (Asteraceae: Gnaphaliinae)

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### Abstract

Keighery, G.J., Taxonomic notes on the *Angianthus drummondii* complex (Asteraceae: Gnaphaliinae). *Nuytsia* 15(2): 253–260 (2004). *Angianthus drummondii* is revised and shown to be a species complex of three allopatric species. The complex comprises *A. drummondii* (Turcz.) Benth., an erect plant with long inflorescence bracts confined to fresh water clay-based wetlands; *A. platycephalus* Benth., a prostrate plant with short broad inflorescence bracts, growing in fresh to brackish clay soils, is resurrected; and a new species *A. halophilus* Keighery, an erect plant with short inflorescence bracts, found on gypsum soils, is described.

### Introduction

During the last decade the Western Australian Department of Conservation and Land Management has been undertaking regional biological surveys of the Swan Coastal Plain and the Agricultural Zone of Western Australia. During these surveys we have noted many species and species complexes that required further taxonomic study. This paper forms part of a continuing series publishing the results of these studies.

*Angianthus* was revised by Short (1983) where he segregated 8 genera (*Cephalosorus*, *Chrysocoryne*, *Dithyrostegia*, *Epitriche*, *Hyalochalymys*, *Pleuropappus*, *Pogonolepis* and *Siloxerus*) from the previously broadly circumscribed genus *Angianthus*. The genus is now characterised by the presence of two inner flat bracts and two outer concave bracts per capitulum, the presence of one rarely two or three capitulum subtending bracts per capitulum, the usual occurrence of two florets per capitulum and the usual presence of minor receptacle axes on the general receptacle. The genus, with the proposed changes given in this paper is confined to Australia and comprises 19 species, with 15 species endemic to Western Australia.

Short (1983) delimited a number of species groups within the genus *Angianthus*. These comprised; the *A. cunninghamii* group (sole member), the *A. tomentosus* group (*A. acrohyalinus*, *A. brachypappus*, *A. cornutus*, *A. conocephalus*, *A. cyathifer*, *A. glabratus*, *A. micropodioides*, *A. microcephalus*, *A. milnei*, *A. prostratus* and *A. tomentosus*) and the *A. drummondii* group (*A. drummondii*, *A. preissianus* and *A. pygmaeus*). Since this revision Short (1990) has described a new species of *Angianthus*, *A. newbeyi*, related to *A. conocephalus* from the northern Avon-Wheatbelt of Western Australia. This species is part of the *Angianthus tomentosus* group.

The species in the *A. drummondii* group are well defined, however, there is considerable variation within the currently circumscribed species *Angianthus drummondii* and *A. preissianus*.

This paper deals with the *Angianthus drummondii* complex, which is considered to contain three closely related allopatric species.

**Amended keys to *Angianthus* (incorporating changes from this paper)**

**A. Amended Key to *Angianthus* species (Adapted from Short, 1983, page 156)**

- 9. Florets 3- or 4- lobed; pollen grains 16-60 per anther ..... **A. preissianus**
- 9. Florets (4) 5- lobed; pollen grains c. 350-500 per anther
  - 10. Major axis prostrate to decumbent
    - 11. stemless dwarf plants ..... **A. prostratus**
    - 11. Major axis decumbent to prostrate, axis 5-8 cm long ..... **A. platycephalus**
  - 10. Major axis erect
    - 12. Compound heads large, broadly to very broadly ovoid, subtended by linear silvery bracts greatly exceeding inflorescence ..... **A. drummondii**
    - 12. Compound heads small, broadly ovoid, subtended by short bracts scarcely exceeding inflorescence ..... **A. halophilus**

**B. Amended Key to *Angianthus* species (after Blackall & Grieve, 1982, p. 814)**

**Section 4**

- A. Stems 5-8 cm or more long ..... **B**
- A. Stemless dwarf plants
  - B. Florets 5 partite
    - C1. Plant prostrate, Floral leaves ovate acuminate, pappus a short jagged ring readily falling off with corolla ..... **A. platycephalus**
    - C2. Plant erect or decumbent ..... **D**
      - D1. Outer involucral bracts linear, long acuminate, 11-13 mm long ..... **A. drummondii**
      - D2. Outer involucral bracts linear - oblanceolate, acuminate, 5-7 mm long ..... **A. halophilus**

**Taxonomic Treatment**

***Angianthus drummondii*** (Turcz.) Benth. Flora of Australia 3: 566 (1867). - *Skirrhophorus drummondii* Turcz., Bull. Soc. Imp. Naturalistes Moscou 24(1): 188 (1851). - *Stylonocerus drummondii* (Turcz.) Kuntze, Rev. Generum Pl. 367 (1891). Type: Nova Hollandia [Western Australia], J. Drummond III no. 123 (holo: KW, n.v.; iso: MEL 541210, PERTH 01058584, PERTH 01058592).

*Annual herb*, major axes mostly simple, erect or 3/5 erect branches from a basal node, 40–80 mm long, sparingly hairy. *Leaves* opposite, linear, soft and succulent, 0.5–1.0 mm wide, 8–17 mm long, basal leaves not longer than stem leaves, grey, hairy, apex acute. *Capitula* over 60 in compound heads, hemispherical, 8–9 mm wide. *Bracts subtending compound heads* conspicuous, forming an inflorescence involucre around the head, exceeding the width of the head in 3/4 rows. Outer row of 6–8 bracts 11–13 mm long, silvery grey, linear with an enlarged base covered in dense silver grey hairs becoming

almost glabrous towards the acute apex. Second whorl of 8 bracts, linear – lanceolate, 7–8 mm long, grey silvery hairy throughout, enlarged base with dense cottony hairs, apex acute. Inner whorl of 8 bracts lanceolate to triangular, some 4–5 mm long,, others 6–7 mm long, grey silvery hairy throughout, enlarged base with dense cottony hairs, apex acute. General receptacle a convex axis. *Capitulum subtending bracts* 2, obovate, c. 2 mm long, 2 mm wide, scarious, glabrous. *Capitula bracts*, 2, concave, c. 2 mm long, midrib sparsely hairy, flat bracts 2, obovate, gradually tapering towards base, 2 mm long, 1 mm wide, glabrous, with an entire wing like extension from the adaxial surface. *Flowers* 2, corolla 5 lobed, tube tapering gradually towards the base, 1.6–1.8 mm long. *Cypsela* +/- obovoid, 0.8 mm long, 0.3 mm in diameter. *Pappus* a small jagged ring, c. 0.1 mm long, soon deciduous. (Figure 1 A-F)

*Other specimens examined.* WESTERN AUSTRALIA: Yoongarrillup Townsite Reserve, 34° 43'S, 115° 26'E, 14 Oct. 1992, B.J. Keighery & N. Gibson 004 (PERTH); Fish Road Nature Reserve, 33° 43'52" S, 115° 23' 20" E, 14 Oct. 1992, B.J. Keighery & N. Gibson 007 and 008 (PERTH); Ruabon Nature Reserve, 33° 39'S, 115° 30'E, 08 Nov. 1992, B.J. Keighery & N. Gibson 653 (PERTH); 2 km N of Waroona, 32° 49'S, 115° 44'E, 27 Nov. 1993, G.J. Keighery s.n. (PERTH); Tuart Forest, NW Ludlow, 33° 37'S, 115° 33'E, 13 Dec. 1994, G.J. Keighery 13226 (PERTH); Byrde Swamp Nature Reserve, 32° 26'S, 115° 49'E, 27 Nov. 1997, G.J. Keighery 15013 (PERTH).

*Distribution.* Recorded from the Swan Coastal Plain IBRA Bioregion (Environment Australia, 2000) only. (Figure 2).

*Habitat.* Occurs on fresh seasonally wet clay soils either grey or brown under *Melaleuca uncinata* / *Melaleuca viminea* shrubland or rarely under *Melaleuca cuticularis* low woodland.

*Flowering Period.* Flowering in late spring, from October to December. Mature fruits and seeds are found in late December to January. Seeds are held in the inflorescence on the dried dead plants until the rains of the following winter.

*Conservation Status.* Conservation Codes for Western Australian Flora: Priority Three. Localized but well conserved, being represented in at least three nature reserves (Ruabon, Fish Road and Byrde) and one national park (Tuart Forest).

*Etymology.* Named after James Drummond, the foremost colonial collector for Western Australia.

*Notes.* Differs from other members of the complex in the long slender outer bracts, the multiple rows of involucre bracts, and the large number of flowers in the head giving the head a hemispherical appearance. The outer involucre bracts are held at right angles to the head during flowering, their bright shiny metallic-grey-white colour contrasting with the bright yellow florets give the flowering plants a star like appearance when viewed from above.

***Angianthus platycephalus*** Benth., Flora Austral. 3: 566 (1867). - *Stylonocerus drummondii* (Benth.) Kuntze, *Rev. Gen. Pl.* 367 (1891). *Type:* Wet places, Tone River [Western Australia], *Oldfield* 85 (*holo:* K, photo seen; *iso:* MEL 541607, PERTH 01059580).

*Annual herb*, major axes prostrate, 15–25 mm long, densely cottony hairy when young becoming sparser with age, simple. *Leaves* opposite, +/- linear, soft and succulent, 0.5–1 mm wide, basal leaves longer than stem leaves, 8–15 mm long, stem leaves 4–7 mm long, grey, hairy, apex long mucronate.

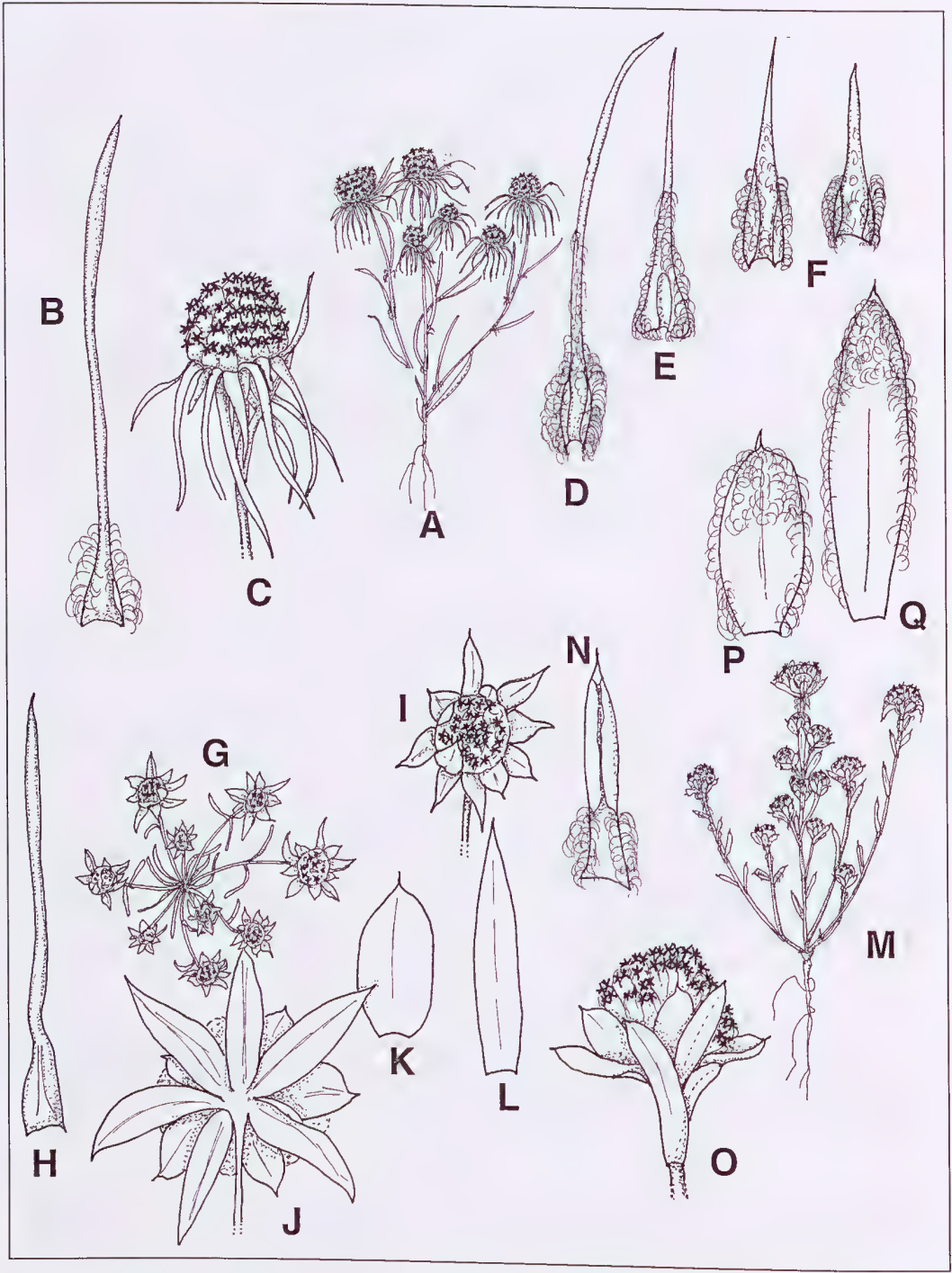


Figure 1: A–F. *Angianthus drummondii*, drawn from G.J. Keighery 15013 (PERTH). A – habit, B – leaf, C – inflorescence, D – outer involucral bract, E – involucral bract of second whorl, F – inner involucral bracts; G–L. *Angianthus platycephalus*, drawn from Keighery 10499 (PERTH). G – habit, H – leaf, I – top view of inflorescence, J – basal view of inflorescence, K – outer involucral bract, L – inner involucral bract; M–Q. *Angianthus halophilus*, drawn from Short 2361 (PERTH). M – habit, N – leaf, O – inflorescence, P – outer involucral bract, Q – inner involucral bract. Scale bar = 10 mm (A, G), 5 mm (C, I, M), 1 mm (B, D–F, H, J–L, N–Q).



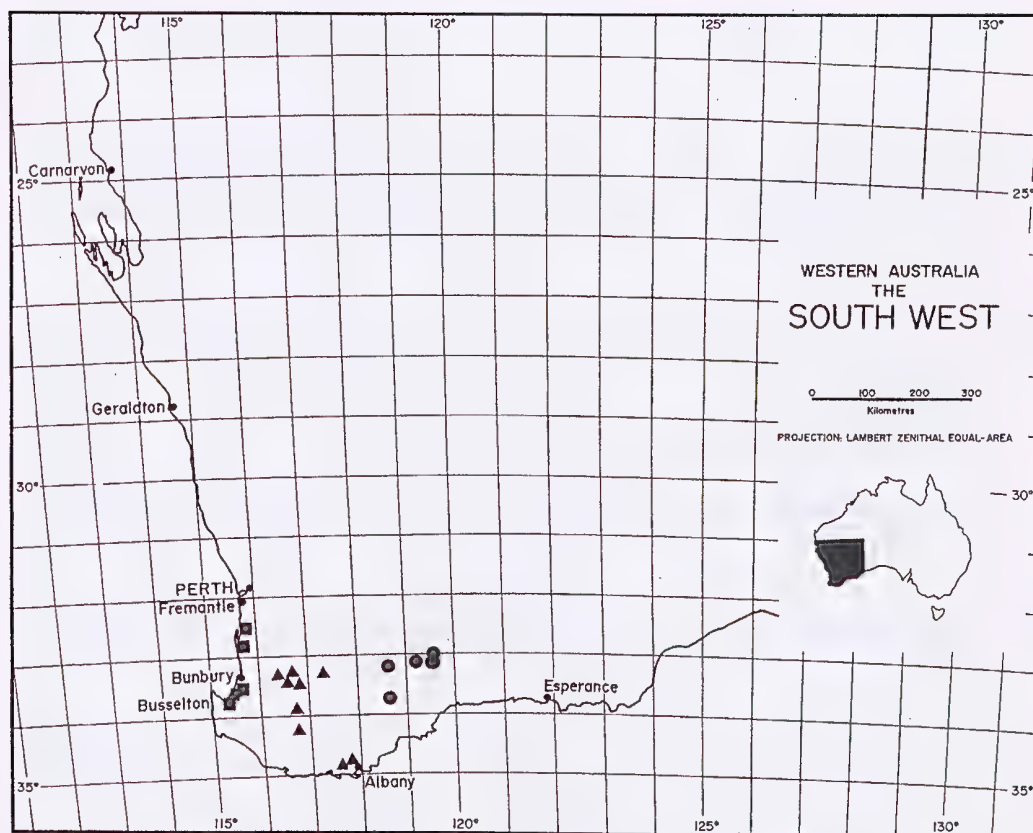


Figure 2: Distribution of members of *Angianthus drummondii* complex: *Angianthus drummondii* ■, *Angianthus platycephalus* ▲, *Angianthus halophilus* ●.

*Capitula* in compound heads, depressed ovoid to hemispherical, 6 – 8 mm wide. *Bracts subtending compound heads* conspicuous, forming an inflorescence involucre around the head, exceeding the width of the Head, comprised of c. 10 bracts in two whorls, outer leaf like, linear – lanceolate, 5–7 mm long, c. 2 mm wide, apex acute, inner elliptical, silvery grey, apex mucronate, 4 mm long, 3 mm wide. General receptacle a small convex axis. *Capitulum subtending bracts* 1(2), obovate, c. 2 mm long, 2 mm wide, scarious, glabrous. *Capitula bracts*, 2, concave, c. 2 mm long, midrib sparsely hairy, flat bracts 2, obovate, gradually tapering towards base, 2 mm long, 1 mm wide, glabrous, with an entire wing like extension from the adaxial surface. *Flowers* 2, corolla 5 lobed, tube tapering gradually towards the base, 1.6–1.8 mm long. *Cypselas* +/- obovoid, 0.8 mm long, 0.3 mm in diameter. *Pappus* a small jagged ring, c. 0.1 mm long. (Figure 1 G-L).

*Other specimens examined.* WESTERN AUSTRALIA: Lake Muir Nature Reserve, 64 km E of Manjimup, 34° 26'S, 116° 41'E, 24 Nov. 1994, A.R. Annels 5005 (PERTH); 23.5 km E of Collie, 33° 25'S, 116° 33' 25"E, 30 Oct. 1997, R.J. Cranfield 11524 (PERTH); 9.2 km SSW of Bowelling on Trigwell Bridge road, 22 Nov. 1998, V. Crowley 799 (PERTH); 6 km W of Bowelling on Coalfields Road, 28 Oct. 1998, V. Crowley 800 (PERTH); 9.5 km from Bowelling on Bowelling-Duranillin Road, 33° 27'S, 116° 34'E, 17 Nov. 1997, R. Davis 4499 (PERTH); south coast area – Walpole/Albany/Stirling Ranges, 14 Dec. 1966, Ehrendorfer 181 (PERTH); Casuarina Nature Reserve, Wagin area, 33° 18' 29" S, 117° 20' 36" E, 18 Feb. 1988, Halse s.n. (PERTH); Wilson Inlet, W. side of mouth of Hay River, 34° 58'S, 117° 27'E, B.G. Hamersley 1710 (PERTH), Duranillin, 33° 31'S, 116° 48'E,

04 Nov. 1988, *G.J. Keighery* 10499 (PERTH); Hotham River, Darling Ranges, 12 Nov. 1904, *M\*\*\* A., s.n.* (PERTH)

*Distribution.* Recorded in the Jarrah Forest and Warren IBRA Bioregions (Environment Australia, 2000), from the Hotham River to Wilson's Inlet, near Denmark, Western Australia. (Figure 2).

*Habitat.* Occurs on non-saline seasonally wet clay soils under low *Verticordia* heath, *Eucalyptus wandoo* woodland on alluvial flats or *Melaleuca uncinata* / *Melaleuca viminea* shrubland.

*Flowering Period.* Flowering in late spring, from October to November. Mature fruits and seeds are found in late December to January. Seeds are held in the inflorescence on the dried dead plants until the rains of the following winter.

*Conservation Status.* Widespread and well conserved.

*Etymology.* *Platycephalus* from the Greek for flat head, probably a reference to the low rounded inflorescence compared to *Angianthus drummondii*.

*Notes.* *Angianthus platycephalus* differs from *Angianthus drummondii* in having a prostrate habit, longer basal leaves, simple floral axis and the short broad inflorescence bracts. This habit means that the species keys to *A. pygmaeus* if couplet 3 is not amended in Short (1983, p. 156).

The collection from Wilson's Inlet (*Hamersley* 1710) is almost glabrous and may be better placed in an unnamed species allied to *A. preissianus*. There are two other collections from saline sites on the Swan Coastal Plain (*Worz* 04.10.16 and *Keighery* 14165) that are this taxon. Further studies of the *Angianthus preissianus* complex are required to resolve this collection.

***Angianthus halophilus* Keighery, *sp. nov.***

*A. platycephalae* Bentham affinis, differt foliis brevis et latis, apex mucronatus et inflorescentia bracteis non excedens inflorescentia.

*Typus:* western edge of Lake King, 33° 05'S, 119° 31' E, Western Australia, 10 November 1983, *P.S. Short & L. Haegi* 2360 (*holo:* PERTH 751650).

*Annual herb*, major axes erect to spreading, 2-6 axes from basal node, 15-50 mm long, densely grey cottony hairy when young becoming sparser with age, simple. *Leaves* opposite, linear to linear-lanceolate, soft and succulent, 0.5-1 mm wide, basal leaves longer than stem leaves, -15 mm long, stem leaves 4-7 mm long, pubescent with long simple grey hairs, apex long mucronate. *Capitula* in compound heads, depressed ovoid to hemispherical, 6-8 mm wide. *Bracts subtending compound heads* forming an inflorescence involucre around the head, equal to or just exceeding the width of the head, comprised of c. 10 bracts in two whorls, outer leaf like, covered with a silvery grey pubescence, linear-ob lanceolate, 5-7 mm long, c. 2 mm wide, apex acute, inner oblanceolate-elliptical, silvery grey, apex mucronate, ca. 4 mm long, ca. 1.5 mm wide. General receptacle a small convex axis. Flowers 30-60 per head. *Capitulum subtending bracts* 1(2), obovate, c. 2 mm long, 2 mm wide, scarious, glabrous. *Capitula bracts*, 2, concave, c. 2 mm long, midrib sparsely hairy on back, flat bracts 2, obovate, gradually tapering towards base, 2 mm long, 1 mm wide, glabrous, with an entire wing like extension

from the adaxial surface. *Flowers* 2, corolla 5 lobed, tube tapering gradually towards the base, ca. 2 mm long. *Cypsel*a +/- obovoid, 0.8 mm long, 0.3 mm in diameter. *Pappus*, absent. (Figure 1 M-Q).

*Other specimens examined.* WESTERN AUSTRALIA: 14.6 km E of Lake Grace, 33° 06'S, 118° 37'E, 6 Oct. 1994, *R.J. Bayer* 94084 (PERTH); western side of Lake King, 6 Oct. 1994, *R.J. Bayer* 94090 (PERTH); Lake King, towards eastern edge, 3 Nov. 1965, *A.S. George* 7293 (PERTH); Lake Cairlocup, 33° 44'S, 118° 44'E, 23 Oct. 1983, *K.R. Newbey* 9805 (PERTH); western edge of Lake King, 33° 05'S, 119° 31'E, 10 Nov. 1983, *P.S. Short & L. Haegi* 2361 (PERTH).

*Distribution.* Recorded in the Avon-Wheatbelt and Mallee IBRA Bioregions (Environment Australia, 2000), from Lake Cairlocup, Lake Grace and Lake King, Western Australia. (Figure 2).

*Habitat.* Occurs on low gypsum rich dunes in saline lakes under *Halosarcia* succulent shrubland or under *Melaleuca* shrubland over *Halosarcia*.

*Flowering Period.* Flowering in late spring, from October to November. Mature fruits and seeds are found in late December to January. Seeds are held in the inflorescence on the dried dead plants until the rains of the following winter.

*Conservation Status.* Conservation Codes for Western Australian Flora: Priority Three. Present in at least two conservation reserves.

*Etymology.* *Halophilus* from the Greek *halos*: salt and *philus* for loving, a reference to the saline gypsum dunes where this species occurs.

*Notes.* *Angianthus halophilus* is closely related to *Angianthus platycephalus* but differs in the short broad leaves with a pungent apex and very short broad inflorescence bracts, which do not exceed the head.

### Acknowledgements

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